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10/593,360	09/19/2006	Saburou Yamagata	MOR-270-A	1223

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EXAMINER

YANG, JIE

ART UNIT	PAPER NUMBER
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1733

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PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No. 10/593,360	Applicant(s) YAMAGATA ET AL.	
	Examiner JIE YANG	Art Unit 1733	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 13 January 2011.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1,5-7,9,10,14,15,17 and 18 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1,5-7,9,10,14,15,17 and 18 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413) |
| 2) <input type="checkbox"/> Notice of Draftperson's Patent Drawing Review (PTO-948) | Paper No(s)/Mail Date. _____ |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08) | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

Claims 1, 6, 7, 9, 10, and 14 are amended; claims 2-4, 8, 11-13, and 16 are cancelled; claims 17 and 18 are added as new claims; and claims 1, 5-7, 9, 10, 14, 15, 17, and 18 remain for examination.

Status of the Previous Rejection

The previous objection of claim 12 under 37 CFR 1.75(c), as being of improper dependent form for failing to further limit the subject matter of a previous claim is withdrawn since claim 12 has been cancelled in view the amendment filed on 1/13/2011.

However, in view of the amendment, a new ground(s) of objection is made (see below).

Claim Objections

Claims 1 and 10 are objected to because of the following reasons: the term “stirring” in the sentence of “wherein the stirring is performed only after the vapor film begins to break” of claims 1 and 10 is not clear because oscillation operation in the instant claims also generating stirring in the cooling liquid. The Examiner suggests to replace term “the stirring” by term “the stirrer stirring” in order to clarify the instant limitation.

Examiner's Notes

The Applicant has amended claims 1 and 10 by cancelling some limitations, for example no longer requires an oscillation device horizontally and reciprocally moving in

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the cooling liquid and a stirrer separately arranged in the cooling liquid, and no longer requires introduction of a gas above the liquid surface level via a gas introduction pipe.

However, the Examiner found that the recorded prior arts still proper for the rejections of the instant claims (see below).

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claims 1, 5-7, 9, 10, 14, 15, 17, and 18 are rejected under 35 U.S.C. 103(a) as being unpatentable over Kazuo (JP 2000-239738, thereafter JP'738) in view of Okuda Motoshige (JP 05-017817, thereafter JP'817) and Saburo et al (JP 2003-286517, thereafter JP'517).

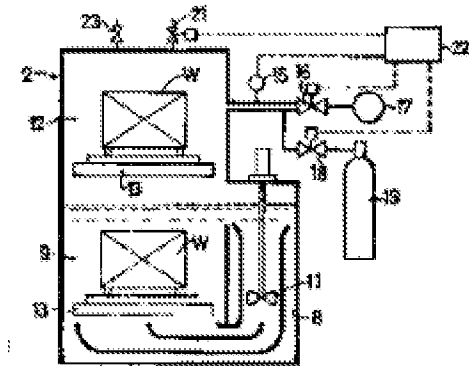
Regarding claims 1 and 10, JP'738 teaches feeding the heated work piece into hardening agent (paragraph [0001] of JP'738) with vibration generating in a quenching tub in order to affect the vapor film (Abstract, paragraphs [0005], [0010], and fig.1 of JP'738), which reads on the cooling heated metal parts, breaking the vapor film by repeatedly varying pressure using oscillations devices as recited in the instant claims and reads

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on the step of heating the metal part as recited in the instant claim 10. JP'738 teaches that the shaft and wings generate oscillatory wave in the cooling agent (Fig. 1 and Paragraphs [0022]-[0023] of JP'738). JP'738 further teaches an oscillatory three dimensional wave (repeatedly varying pressure) in the direction of a vapor film covering a work piece propagated through a quenching agent (Abstract, paragraph [0023] of JP'738). The application of repeatedly varying pressure in the form of a three dimensional wave would inherently result in a change of the pressure applied to the liquid level of the cooling liquid as recited in the instant claims. MPEP 2112.III&IV. JP'738 does not specify changing a pressure to be applied to a liquid surface level of the cooling liquid as recited in the instant claims. JP'817 teaches a method for hardening treatment (Abstract of JP'817). JP'817 teaches pressure control through opening and closing of a supply valve and the gas has been introduced above the liquid surface level as shown in the following Fig, which may control the atmosphere pressure in a hardening chamber (Abstract of JP'817). Therefore, it would have been obvious to one skilled in the art to apply which reads on the limitation of repeatedly varying the pressure repeatedly expands and contracts the vapor film causing a fluctuation in the vapor film; and the limitation of breaking

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the vapor film at an initial point where a thickness of the vapor film has decreased due to the fluctuation as recited in the instant claims.



Regarding the limitation of stirring the cooling liquid with the stirrer and the stirring is performed only after the vapor film begins to break as recited in the instant claims 1 and 10, JP'738 clearly teaches that the steam film breaking can fall directly to a work piece, which makes the cooling rate of the work piece fall and causes dispersion in the quality of quenching (Paragraph [0002] of JP'738). However, JP'738 in view of JP'817 does not specify the further stirrer stirring the cooling liquid after the vapor film begins to be broken as recited in the instant claims. JP'517 teaches a quenching method of applying a jet stirring to a liquid coolant after applying oscillations with a vibration stirring to liquid coolant in gas above the liquid surface as demonstrated by JP'817 in the

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process of JP'738 in order to control the atmosphere pressure in the hardening chamber (Abstract of JP'817). JP'738 teaches that the oscillating generating means to make the oscillatory wave of a direction which removes a wrap steam film for a work piece efficiently spread (Paragraphs [0005] and [0010] of JP'738), order to uniformly remove the vapor film (Abstract, claim 1, paragraphs [0008] and [0044] of JP'517). JP'517 teaches the jet stirring starting time is controllable and JP'517 provides different jet stirring modes (Fig.4-9 and paragraphs [0007]-[0020] of JP'517) with different cooling results (Fig.12-20 of JP'517). Therefore, it would have been obvious to one skilled in the art to apply jet stirring and control the starting time of the jet stirring, for example after the vapor film begins to break as taught by JP'517 in the process of JP'738 in view of JP'817 in order to control the fluctuation of the cooling power to obtain the desired cooling results (Abstract and Fig.12 of JP'517).

Regarding claims 5-7, JP'738 teaches using multiple oscillation devices (Fig. 1, 2, and 5 of JP'738) as claimed in the instant claim 5, JP'738 teaches adjusting the frequency of the oscillation devices (Abstract, paragraph [0023] of JP'738), which reads on the limitations of the instant claims 6 and 7.

Regarding claim 9, JP'738 in view of JP'817 and JP'517 teaches further stirring the cooling liquid after the vapor film begins to be broken as discussed in the rejection for the instant claims 1 and 10 above. JP'517 teaches that applying jet stirring in boil stage causes diffusion to uniformly remove steam film (paragraphs [0017]-[0018] of JP'517), JP'517 teaches the flow of the jet in jet stirring set to $5\text{m}^3/\text{hr}$, and JP'517 teaches the stirring intensity can be changed according to the shape and construction material of the work hardened (Fig. 10, paragraphs [0020], [0033] and [0039] of JP'517), which reads on the limitation of adjusting intensity of stirring as recited in the instant claim 9. Therefore, it would have been obvious to one skilled in the art to apply jet stirring and control the diffusing and stirring intensity as taught by JP'517 in the process of JP'738 in view of JP'817 in order to control the fluctuation of the cooling power to obtain the desired cooling results (Abstract and Fig.12 of JP'517).

Regarding claims 14 and 15, JP'738 does not specify the limitation of the gas introducing and exhausting as recited in the instant claims, JP'817 teaches pressure control through opening and closing of a supply valve and JP'817 teaches that the gas has been introduced above the liquid surface level and exhausted after cooling (Fig.2, paragraphs [0013]-[0014] of

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JP'817), which meets the requirement of the limitations in the instant claims. Therefore, it would have been obvious to one skilled in the art to control gas as demonstrated by JP'817 in the process of JP'738 in order to control the atmosphere pressure in the hardening chamber (Abstract of JP'817). JP'738 in view of JP'817 does not specify introducing gas directly into the cooling liquid as recited in the instant claims, JP'517 teaches that the jet stirring with flow jet blew off from rocket engine jets into an upflow which goes above the low part of the cooling pool (Fig. 1, paragraph [0025] of JP'517), which reads on the limitation of the gas directly introducing into cooling liquid as recited in the instant claims. Therefore, it would have been obvious to one skilled in the art to introduce gases directly into cooling liquid as taught by JP'517 in the process of JP'738 in view of JP'817 in order to control the fluctuation of the cooling power to obtain the desired cooling results (Abstract and Fig.12 of JP'517).

Regarding claims 17 and 18, as discussed in the rejection for the instant claims 1 and 10, JP'517 teaches the jet stirring starting time is controllable and JP'517 provides different jet stirring modes (Fig.4-9 and paragraphs [0007]-[0020] of JP'517) with different cooling results (Fig.12-20 of JP'517), which includes the mode of continuously varied in applying the

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oscillations to the cooling liquid (claim 17) and the mode of intermittently varied in applying the oscillations to the cooling liquid (claim 18). Therefore, it would have been obvious to one skilled in the art to apply the mode of continuously varied in applying the oscillations to the cooling liquid or the mode of intermittently varied in applying the oscillations to the cooling liquid as demonstrated by JP'517 in the process of JP'738 in view of JP'817 in order to control the fluctuation of the cooling power to obtain the desired cooling results (Abstract and Fig.12 of JP'517).

Response to Arguments

Applicant's arguments filed on 1/13/2011 with respect to claims 1, 5-7, 9, 10, 14, 15, 17, and 18 have been fully considered but they are not persuasive. Regarding the arguments related to the amended features, the Examiner's position is stated as above.

In the remark, the Applicant argues:

JP'517 does not teach the limitation of the further stirring the cooling liquid after the vapor film begins to be broken as recited in the instant claims because the liquid coolant 2 in JP'517 is stirred as soon as vibration stirrer 10 operates. Vibration stirrer 10 of JP'517 does not read on the claimed step of applying of a repeatedly varying pressure to break a vapor film, as recited in the instant claims 1 and 10, this step must occur before any stirring is performed.

In response,

Regarding the argument, the Examiner disagrees with the Applicant's argument because the limitation in the instant claims 1 and 10 indicates applying a repeatedly varying pressure to break a vapor film via oscillation technique, which is a repetitive variation. The term vibration is sometimes used more narrowly to mean a mechanical oscillation but sometimes is used to be synonymous with "oscillation" (Refer to the definition of term "Oscillation" from Wikipedia, the free encyclopedia). Therefore, the controlling of the vibration stirring and the jet stirring as taught by JP'517 reads on the limitation of controlling the oscillation for breaking vapor film and the stirrer stirring of the instant claims 1 and 10. JP'738 teaches oscillations will lead to generate oscillations wave which removing the wrap steam film (paragraphs [0010] –[0011] of JP'738) and the oscillation wave will stir the cooling liquid because it is a vibration to the cooling liquid. As pointed out in the rejection for the instant claims 1 and 10, because JP'738 in view of JP'817 teaches applying the same oscillations to break the vapor film and JP'517 teaches the jet stirring starting time is controllable and JP'517 provides different jet stirring modes (Fig.4-9 and paragraphs [0007]-[0020] of JP'517) with different cooling results (Fig.12-20 of JP'517). Therefore, it would have been obvious to one skilled in the art to apply jet stirring and control the starting time of the jet stirring, for example after the vapor film begins to break as taught by JP'517 in the process of JP'738 in view of JP'817 in order to control the fluctuation of the cooling power to obtain the desired cooling results (Abstract and Fig.12 of JP'517).

Conclusion

Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Jie Yang whose telephone number is 571-2701884. The examiner can normally be reached on IFP.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Roy King can be reached on 571-2721244. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

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Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

JY

/ Roy King/

Supervisory Patent Examiner, Art Unit 1733